

REMARKS

Consideration of this application is requested in light of the above amendments and following remarks.

Status of the Claims

Claims 1-24 are currently pending in this application, among which claims 1-13 are withdrawn from consideration, i.e., claims 14-24 are being under consideration. Claims 14-24 stand rejected. By this paper, claims 14 and 24 are amended. No new matter has been added by this amendment.

Rejections under 35 U.S.C. §§102 and 103

Claims 14-17 and 19-24 have been rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent No. 5,688,642 to Chrisey et al. ("Chrisey"). Claim 18 has been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Chrisey in view of U.S. Patent No. 6,159,695 to McGovern et al. ("McGovern").

Independent claims 14 and 24 have been amended for further clarification. In particular, amended claim 14 recites, *inter alia*, "wherein the first functional group is a mercapt group, the second function group is an amino group, the probe is a nucleic acid and the mercapt group and the amino group are directly bonded through ionic bond." Amended claim 24 recites similar features to amended claim 14. Support for the amendments may be found throughout the original specification including, e.g., page 12, line 26 through page 13, line 10.

One of the aspects of the amended claims 14 and 24 is that the first and second groups are directly bonded without a crosslinking agent thereby removing the reference in which groups are bonded by covalent bond through crosslinking agent. In other words, the mercapt groups and amino groups are ionic-bonded at end portions of nucleic acid, and mercapt groups are located

on the side of nucleic acid, and the substrate surface is located on the side of amino group thereby bonded to form a strong bond.

In the present invention, strong ionic bonds are formed on end portions of nucleic acid, and amino groups are formed on the substrate surface. By this constitution, a probe array having high sensitive probes by which high intensity of fluorescence can be exhibited and mismatch can also be detected can be first provided. That is, in order to provide amino groups on the substrate surface and mercapt groups at end portions of nucleic acid, those groups are subjected to coupling by ionic bond. The effect obtained by the constitution is supported in the original specification. For example, see the result of the extremely high intensity of fluorescence in Examples 1 to 5 compared to the results of Examples 6 and 7 having different constitution (i.e., page 26, line 15 through page 37, line 16).

Chrissey discloses a method for bonding nucleic acid to a surface of a glass substrate by covalent bond using heterobifunctional cross-linker. Specifically, an aminosilane coupling agent is bonded to the substrate surface, and maleimide groups are formed on the surface by the heterobifunctional cross-linker, and then the maleimide groups are covalent-bonded to mercapt groups modified at end portions of the nucleic acid. Therefore, in Chrissey, mercapt group and amino group are not directly ionic-bonded, as required by amended claims 14 and 24 of the present application.

Additionally, Chrissey discloses that oligonucleotide is electrostatically bonded by an aminosilane coupling agent, e.g., the constitution explained in Example 3 and Fig. 4 of Chrissey shows electrostatic bond. However, as is apparent from the Chrissey's disclosure, the constitution in Chrissey is not the constitution in which mercapt group is present at end portion as required by

the present invention of claims 14 and 24. That is, the bonding in Chrisey is maintained by a weaker bond than the bond at end portions of the nucleic acid.

McGovern is cited as disclosing a linker that comprises a polyether chain. However, McGovern does not remedy Chrisey because it does not teach the above aspect of the present invention, i.e., wherein the first functional group is a mercapt group, the second function group is an amino group, the probe is a nucleic acid and the mercapt group and the amino group are directly bonded through ionic bond.

Accordingly, each of claims 14 and 24 as amended is believed neither anticipated by nor rendered obvious in view of the cited references (i.e., Chrisey and McGovern), either taken alone or in combination, for at least the reasons discussed above.

Reconsideration and withdrawal of the rejection of claims 14 and 24 under 35 U.S.C. §102(b) is respectfully requested.

Applicants have chosen in the interest of expediting prosecution of this patent application to distinguish the cited document from the pending claims as set forth above. These statements should not be regarded in any way as admissions that the cited documents are, in fact, prior art. Likewise, Applicants have chosen not to swear behind the documents cited by the office action or to otherwise submit evidence to traverse the rejection at this time. Applicants, however, reserve the right, as provided by 37 C.F.R. §§ 1.131 and 1.132, to do so in the future as appropriate. Finally, Applicants have not specifically addressed the rejections of the dependent claims. Applicants respectfully submit that the independent claim, from which they depend, is in condition for allowance as set forth above. Accordingly, the dependent claims also are in condition for allowance. Applicants, however, reserve the right to address such rejections of the dependent claims in the future as appropriate.

Applicants believe that the application as amended including the new claim is in condition for allowance and such action is respectfully requested.

AUTHORIZATION

No petitions or additional fees are believed due for this amendment and/or any accompanying submissions. However, to the extent that any additional fees and/or petition is required, including a petition for extension of time, Applicants hereby petition the Commissioner to grant such petition, and hereby authorizes the Commissioner to charge any additional fees, including any fees which may be required for such petition, or credit any overpayment to Deposit Account No. 13-4500 (Order No. 1232-5579). A DUPLICATE COPY OF THIS SHEET IS ENCLOSED.

An early and favorable examination on the merits is respectfully requested.

Respectfully submitted,
MORGAN & FINNEGAN, L.L.P.

Dated: December 3, 2007

By: Sungho Hong
Sungho Hong
Registration No. 54,571

Correspondence Address:

MORGAN & FINNEGAN, L.L.P.
3 World Financial Center
New York, NY 10281-2101
(212) 415-8700 (Telephone)
(212) 415-8701 (Facsimile)

Applicants believe that the application as amended including the new claim is in condition for allowance and such action is respectfully requested.

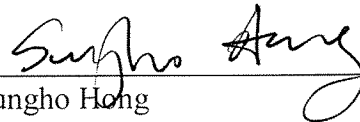
AUTHORIZATION

No petitions or additional fees are believed due for this amendment and/or any accompanying submissions. However, to the extent that any additional fees and/or petition is required, including a petition for extension of time, Applicants hereby petition the Commissioner to grant such petition, and hereby authorizes the Commissioner to charge any additional fees, including any fees which may be required for such petition, or credit any overpayment to Deposit Account No. 13-4500 (Order No. 1232-5579). A DUPLICATE COPY OF THIS SHEET IS ENCLOSED.

An early and favorable examination on the merits is respectfully requested.

Respectfully submitted,
MORGAN & FINNEGAN, L.L.P.

Dated: December 3, 2007

By: 
Sungho Hong
Registration No. 54,571

Correspondence Address:

MORGAN & FINNEGAN, L.L.P.
3 World Financial Center
New York, NY 10281-2101
(212) 415-8700 (Telephone)
(212) 415-8701 (Facsimile)